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MCRD PARRIS ISLAND
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LETTER REGARDING U S EPA REGION IV COMMENTS ON THE REMEDIAL INVESTIGATION REPORT FOR SITES 9, 16, 27 AND 55 MCRD PARRIS ISLAND SC
3/2/2012
U S EPA REGION IV

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

March 2, 2012

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Naval Air Station, JAX
Navy Facilities Engineering SE
Installation Restoration, SC IPT
Attn: Mr. Charles Cook
PO Box 30
North Ajax Street, Bldg 135
Jacksonville, FL 32212-0030

AND

Commanding General
Marine Corps Recruit Depot
Natural Resources & Environmental Affairs Office
Attn: Ms. Lisa Donohoe
PO Box 5028
Parris Island, SC 29905-9001

Dear Mr. Cook and Ms. Donohoe:

The U.S. Environmental Protection Agency (EPA) has completed its review of the Remedial Investigation (RI) Report for Sites 9, 16, 27, and 55, Marine Corps Recruit Depot (MCRD), Parris Island, South Carolina (November 2011). The resulting comments are attached. EPA appreciates the hard work that has gone into the investigation and analysis of site conditions at these four closely related sites. A lot of useful information is captured in the report. While a lot of information is provided, the document falls short of specifying some necessary detail and explaining exactly what the information results in with respect to the need for action. Therefore, it is unclear that the Navy and MCRD are prepared to take the necessary actions required by the conditions of the sites. Deficiencies were noted and clarification is needed. Please note that EPA has written the attached comments in a manner that should identify EPA's concerns, however, allow the Navy and MCRD the flexibility to move forward without major revisions to the document, provided the Navy and MCRD agree to address these concerns with summary revisions to the main sections of the RI and corresponding summary statements in Section 7, Conclusions and Recommendations. If the document is not revised in a sufficient manner given EPA's general comments, EPA will be forced to submit a magnitude of specific comments as follow-up to the general comments. EPA has spoken with the Navy regarding this approach to providing

feedback on this document and the Navy has indicated this would be an acceptable approach to specify revisions needed to the document without generating numerous comments.

EPA expects a response to the attached comments and revisions to the document. EPA is available for consultation during this process if the Navy and/or MCRD are unsure what will suffice as a response and revision for these general comments. Specific comments should be addressed as requested in the comment. Please feel free to call with any questions you may have regarding these comments. I can be reached at 404-562-9969.

Sincerely,

Lila Llamas

Lila Llamas
Senior RPM
Federal Facilities Branch
Superfund Division

Attachment

cc: Meredith Amick, SCDHEC
Peggy Churchill, TtNus

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
TECHNICAL REVIEW OF THE
REMEDIAL INVESTIGATION REPORT FOR
SITE 27 – MOTOR TRANSPORTATION FACILITY
SITE 55 – FIBER OPTIC VAULT
SITE 9 – FORMER PAINT WASTE STORAGE AREA
AND SITE 16 – PESTICIDE RINSATE DISPOSAL AREA
NOVEMBER 2011

MARINE CORPS RECRUIT DEPOT (MCRD)
PARRIS ISLAND, SOUTH CAROLINA

GENERAL COMMENTS:

1. **Identifying Principal Threat Wastes (PTW):** The Navy and MCRD should identify the Light Non-Aqueous Phase Liquid (LNAPL) present at Sites 55 and 27 as Principle Threat Waste (PTW) in accordance with the National Contingency Plan (NCP) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The identification in the RI Report of LNAPL (floating on top of the water table and/or adsorbed into the pore spaces of soil in the smear zone) as PTW is important in order to focus the forthcoming Feasibility Study (FS) on developing and properly evaluating remedial alternatives consistent with the statutory and regulatory requirements described in the General Comments below.

   The concept of principal threat waste as developed by EPA in the NCP is to be applied on a site specific basis when characterizing source material. In EPA's *Guide to Principal Threat and Low-Level Threat Waste,* "source material" is defined as material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, to surface water, to air, or acts as a source for direct exposure. Examples of source materials are drummed waste, Non-Aqueous Phase Liquids (NAPL), contaminated soil and debris, contaminated sediments and sludge, etc. "Principal Threat Wastes" are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. They include liquids and other highly mobile materials (e.g., solvents) or materials having high concentrations of toxic compounds. Examples of PTW include but are not limited to:

   - Liquids – wastes contained in drums, lagoons, tanks, free product (LNAPL or DNAPL)
   - Mobile source materials – surface soil or subsurface soil containing high concentrations of contaminants of concern that are (or potentially are) mobile due to wind entrainment, volatilization (e.g., VOCs), surface runoff, or subsurface transport.
   - Highly toxic source material – buried drummed non-liquid wastes, buried tanks containing non-liquid wastes, or soils containing significant concentrations of highly toxic materials.

2. **Statutory and Regulatory Requirements Calling for Treatment of PTW:** After identifying the LNAPL as PTW, the Navy and MCRD should recommend treatment of the LNAPL at Sites 55 and 27 in accordance with the NCP and CERCLA. The NCP, CERCLA and EPA guidance specify requirements related to addressing principal threat wastes through a response action and the preference to treat wastes to the maximum extent practicable (or publish an explanation why it is not practicable). The RI Report should identify this requirement in order to focus the FS. The following provides a small portion of the regulatory framework in support of this comment.

CERCLA Section 121(b)(1) General Rules provides in part:

Remedial actions in which treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances, pollutants, or contaminants is a principal element are to be preferred over remedial actions not involving such treatment.

The President shall conduct an assessment of permanent solutions and alternative treatment technologies or resource recovery technologies, that in whole or in part, will result in a permanent and significant decrease in the toxicity, mobility, or volume of the hazardous substance, pollutant, or contaminant.

The President shall select a remedial action that is protective of human health and the environment, that is cost effective, and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. If the President selects a remedial action not appropriate for preference under this subsection, the President shall publish an explanation as to why a remedial action involving such reductions was not selected.

Under the NCP at 40 CFR § 300.430(a)(iii)(A), EPA expects to use treatment to address the principal threats posed by a site, wherever practicable. Principal threats for which treatment is most likely to be appropriate include liquids, areas contaminated with high concentrations of toxic compounds, and highly mobile materials.

3. **Statutory and Regulatory Requirements for Treatment Alternatives in the FS**: The Navy and MCRD should prepare the RI Report in such a manner as to focus the forthcoming FS. The following provides a small portion of the regulatory framework in support of this comment.

In recognition of the mandates and preference expressed in CERCLA and the NCP, EPA established program management principles and certain expectations in the NCP regarding types of remedies that EPA has found to be most appropriate for different types of waste. Details can be found in the Preamble to the Final NCP Rule, 55 Federal Register 8666, 8702 (March 8, 1990) and Preamble to the Proposed NCP Rule, 53 Federal Register 51394, 51422 (Dec. 21, 1988).

Although remedy selection decisions are ultimately site-specific determinations based on an analysis of the remedial alternatives using the nine criteria, these expectations are intended to streamline and focus the RI/FS on appropriate waste management options. They reflect EPA's belief that certain source materials are addressed best through treatment because of technical limitations to the long-term reliability of containment technologies, or the serious consequences of exposure should a release occur. For example, EPA's experience that highly mobile waste generally requires treatment may help to focus the detailed analysis in the FS on treatment alternatives, as compared to containment alternatives or LUCs. (55 Federal Register at 8702) Also, treatment that destroys or reduces hazardous properties of contaminants (e.g., toxicity or mobility) frequently will be required to achieve solutions that afford a high degree of permanence. (53 Federal Register at 51422)

Under the NCP at 40 C.F.R. § 300.430(e) *Feasibility Study*, the primary objective of the feasibility study (FS) is to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to the decision-maker and an appropriate remedy be selected. EPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA - Interim Final", U.S. EPA

October 1988 (OSWER Dir. 9355.3-01) [hereinafter *RI/FS Guidance*] further provides that alternatives should be developed ranging from one that would eliminate or minimize to the extent feasible the need for long-term management (including monitoring) at a site to one that would use treatment as a primary component of an alternative to address principal threats at the site. In particular, the expectation that principal threats at the site should be treated, wherever practicable, and that consideration should be given to containment of low-threat material, forms the basis for forming alternatives. A detailed analysis in the FS consists of evaluating remedial alternatives against nine criteria specified in the NCP, including the criterion *Reduction of toxicity, mobility, or volume through treatment,* which addresses how treatment is used to address principal threats at the site. This evaluation criterion addresses the statutory preference for selecting remedial actions that employ treatment that permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances as their principal element. This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of total mass of toxic contaminants, irreversible reduction in contaminant mobility, and/or reduction in the total volume of contaminated media. In evaluating this criterion an assessment should be made as to whether treatment is used to reduce principal threats, including the extent to which toxicity, mobility, or volume are reduced either alone or in combination. Additionally, alternatives must be assessed against the *Long-term effectiveness and permanence* criterion which focuses on the degree to which an alternative reduces toxicity, mobility, or volume through treatment, minimizes residual risks and affords long-term protection. Pursuant to 40 C.F.R. § 300.430(e)(3), for source control actions, the lead agency shall develop, as appropriate:

(i) A range of *alternatives in which treatment that reduces the toxicity, mobility, or volume of the hazardous substances, pollutants, or contaminants is a principal element.* As appropriate, this range shall include an alternative that removes or destroys hazardous substances, pollutants, or contaminants to the maximum extent feasible, eliminating or minimizing, to the degree possible, the need for long-term management. The lead agency also shall develop, as appropriate, other alternatives which, at a minimum, *treat the principal threats posed by the site* but vary in the degree of treatment employed and the quantities and characteristics of the treatment residuals and untreated waste that must be managed." (Emphasis added)

4. **Statutory and Regulatory Requirements for Returning Groundwater to its Beneficial Use**: The Navy and MCRD appear to recommend remediation of groundwater at Sites 27 and 55 in that Section 7 references COCs being retained and alternatives being screened in Appendix H. In case there is any doubt, the following provides supporting regulatory references for the requirement to return groundwater to its beneficial use.

NCP Rule Expectations –

"Return usable ground waters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site." [Ref 40 CFR §300.430(a)(1)(iii)(F)]. 'Restoration time frame' is defined as the period of time required to achieve selected cleanup levels in the ground water at all locations within the area of attainment. The 'area of attainment' defines the area over which the cleanup levels will be achieved in the groundwater.

"Where restoration of the ground water to beneficial uses is not practicable, EPA expects to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction." [Id.]

"Use institutional controls such as water use and deed restrictions to supplement engineering controls. Not a substitute for active response measures." [§300.430(a)(1)(iii)(D)]

Groundwater Use and Classification – See Preambles to Proposed NCP at 53 FR 51433-35 (December 21, 1988) and Final NCP at 55 FR 8732- 8735 (March 8, 1990).

"It is EPA policy to consider the beneficial use of ground water and to protect against current and future exposures."

"Ground water is a valuable resource and should be protected and restored if necessary and practicable."

"Ground water that is not currently used may be a drinking water supply in the future."

EPA will make use of promulgated state classification when determining appropriate remediation approach unless it would lead to less stringent solutions than with EPA classification.

Classification of ground water is only used to determine the scope of site-specific remedial actions and does not provide regional classification of ground waters.

CERCLA regarding the Degree of Cleanup –

Under Section 121(d) remedial actions shall attain a degree of cleanup which assures protection of human health and the environment.

Remedial action shall attain ARARs unless in limited circumstances it is determined one of the five waivers specified in Section 121(d)(4) can be invoked.

Overall protection of human health and the environment and compliance with ARARs are threshold requirements that each remedial alternative must meet in order to be eligible for selection. [Ref 40 CFR 300.430(f)(1)(i)(A)]

"SDWA MCLs are generally considered 'relevant and appropriate' to determining acceptable exposure for groundwater that is or may be used for drinking." [55 FR 8750]

5. **Motor-T Construction Activities and Impacts:** EPA understands the Site conditions at 27, and perhaps to some degree 55, have changed due to the construction of the Motor-T facility. Whereas it would have been appropriate to include in this RI Report a revised conceptual site model and extensive updated vertical cross-sections to document the change in site conditions based on as-built drawings, rather than require these as part of the RI Report the Navy may commit in the report to provide this detailed update in support of a scoping session for the forthcoming Draft Feasibility Study (FS D1). This detailed information will be necessary to properly assess alternatives and to design remedial actions in the future. (See request for specific information in comments below.)

6. **Motor-T Activities - Obstruction of Investigation**: In follow-up to the previous comment, EPA is concerned with the disruption that construction activities at Site 27 have had on the CERCLA remedial investigation. Page 3-33 of the RI Report indicates well data was not obtainable from inaccessible wells due to issues associated with the construction, and the missing well data has affected the groundwater flow interpretation. At the time the Navy and MCRD notified EPA that construction would begin at Site 27, and after many attempts by EPA to discourage initiation of construction activities at the Site, EPA placed the Navy and MCRD on notice that the invasive activities of the Motor-T Construction at Site 27 were to be limited to 5 feet below original grade as planned for and as presented to EPA; that no invasive or construction activities were to occur across the boundary into Site 55; that the integrity of existing wells were to be maintained; that no construction activities, including invasive intrusion, buildings/structures, placement of fill, and or lay down areas were to impeded in any manner the CERCLA investigation of Sites 9, 16, 27, and 55; and that the Navy is on record as committing to remediate contamination as found to be indicated as necessary at any point in the future, even if the subject contamination is found to be under the newly constructed facilities. The RI report indicates missing well data has affected the groundwater flow interpretation. This is unacceptable and may place the Navy and MCRD at risk for potential enforcement action. The Navy/MCRD should obtain the missing data and revise the groundwater flow interpretation. Under separate cover EPA will address other concerns

associated with construction activities which do not directly impact this report at this time, but may have impacts to the investigation otherwise and could potentially result in enforcement action.

7. **Isoconcentration Maps – Applicable screening criteria:** Isoconcentration maps for the various contaminants detected in surface soil, subsurface soil and shallow groundwater and intermediate groundwater at Sites 9, 16, 27 and 55 are presented in Figures 4-18 through 4-37 of the Remedial Investigation Report for Site 27 – Motor Transportation Facility, Site 55 – Fiber Optic Vault, Site 9 – Former Paint Waste Storage Area, and Site 16 – Pesticide Rinsate Disposal Area dated November 2011 (RI Report). While the relative isoconcentration contours are color coded, applicable screening criteria levels were not presented for the relevant contaminants and associated medium in the respective figures. Tag maps were presented that indicates contaminant results in exceedance of relative contaminant screening criterion. However, the location of exceedances of applicable screening criteria relative to the contaminant isocontours is not easily seen in the isoconcentration maps. To address this issue, revise the isoconcentration maps to provide a clear understanding of the extent of contamination and to further support the interpretation that the magnitude and horizontal extent of soil and groundwater contamination at Sites 9, 16, 27 and 55 is adequately delineated.

8. **Isoconcentration Maps – Inclusion of 2010 data only:** Apparently only 2010 data was used in the development of isoconcentration maps as presented in Section 4, Figures 4-18 through 4-37, although a more comprehensive set of data appears to have been used for the exceedances tag maps. The site wide comprehensive set of data should be reviewed to determine if samples representing potential hot spots or more highly concentrated soils have been omitted by including only 2010 data. The 2010 sampling event was designed to delineate contamination where data gaps existed, not only horizontally but also vertically, but was not designed to stand on its own. For instance, it was determined additional samples were not needed from the more highly contaminated areas because these were already known areas of concern. However, omission of this existing historical data results in isoconcentration maps which are misleading and missing pertinent source material information. This may be true more so for soils than groundwater, however the same may be true for groundwater to some degree. Please review the complete data set and determine if historical elevated hits should be included along with the 2010 data to better represent the isoconcentration contours in these figures. Please update the figures accordingly.

9. **Cross-Sections of Contamination:** The RI Report does not present cross sections depicting in profile the magnitude and extent of soil and groundwater contamination in the subsurface. As such, the interpretation that the magnitude and vertical extent of soil and groundwater contamination has been adequately delineated has not been fully demonstrated. In order to promote a better understanding and further support the interpretation that the magnitude and vertical extent of soil and groundwater contamination at Sites 9, 16, 27 and 55 is adequately delineated, revise the RI Report to address this issue.

10. **Risk Assessment – LNAPL Needs Qualitative Assessment:** According to Section 4.4, Floating Product, LNAPL underlies a large portion of Site 55 and the eastern side of Site 27 adjacent to 55, however, the potential for direct exposure to LNAPL has not been addressed in the HHRA thereby underestimating potential human health risks to construction or trench workers who may come into contact with LNAPL in the subsurface during excavation activities and underestimating vapor intrusion potential risk for hypothetical future residents. Risks associated with direct contact with LNAPL have not been accounted for in the risk assessment in that the LNAPL layer sits on top of the water table and was therefore not included in the groundwater

concentrations used in the assessment, and the LNAPL sorbed into the pore spaces of the saturated soils was excluded in part by including only unsaturated soil concentrations (thereby excluding some of the higher concentrated soils from the risk assessment). Additionally, the vapor intrusion assessment apparently did not include the LNAPL since the guidance for assessing vapor intrusion should not be used when product is present in the groundwater. Nor was the LNAPL smear zone included in the vapor intrusion assessment in that no soil sources were addressed in the assessment and no soil gas data was available.

While it is understood that much of the LNAPL is located below the thin clay layer estimated to be between 6 and 8 feet bgs, the conceptual site models for Site 27 and 55 indicate that future construction workers or trench workers may come into contact with subsurface soil and shallow groundwater at these depths. Additionally, hypothetical future residents or other building occupants over the LNAPL source zone may be exposed to vapors from the LNAPL. It is understood that risk assessment methodology to evaluate direct contact exposure to LNAPL has not been established in EPA guidance; however, the HRA should acknowledge that LNAPL represents an exposure medium and include this exposure pathway in the risk assessment for qualitative evaluation as well as address it in the uncertainty analysis. A qualitative assessment of the potential risk associated with exposure to LNAPL should be incorporated into the risk assessment and should recommend protective measures be taken. The qualitative assessment should reference the determination that LNAPL is PTW and as such treatment is expected, rather than remedial action being driven by a quantitative measure of risk. Furthermore, the Navy should clarify the risk assessment quantified results do not account for these exposures and should not be considered fully representative of the area inside of the LNAPL zone of concern (see Figure 4-38).

The Navy and MCRD should note that remediation of LNAPL is often incomplete, leaving a residual smear zone in subsurface soils, which may require protective measures (e.g. LUCs) after remedial efforts are complete regardless of the RI quantitative risk assessment results. Alternatively, a post remedial risk assessment may be needed to address risk remaining on site after remediation of the LNAPL is complete.

11. **Risk Assessment Inconsistencies:** In general the human health risk assessment (HHRA) included in the RI Report has followed the most current United States Environmental Protection Agency (EPA) risk assessment guidance. However, several inconsistencies were observed in how the four separate sites were carried through the risk assessment steps. For example, it appears that a master list of chemicals of potential concern (COPCs) was identified for Sites 27 and 55 by combining the data sets for both sites. The COPC screen was then conducted by comparing the maximum detected concentration from the combined data sets to screening levels in surface soil, subsurface soil, and groundwater. However, following the combined COPC screen, the data sets were no longer combined and different exposure point concentrations (EPCs) and chemical intakes were estimated to generate a site-specific risk estimate for each site. It is unclear why the COPC selection step was not conducted separately for Sites 27 and 55 to arrive at a unique list of COPCs for each site. As a result of combining the data sets for COPC screening, it is difficult to reconcile some of the descriptions of the maximum and average concentrations. For example, Section 6.4.3.5, Lead Risks, identifies the maximum concentration of lead in surface soil as 1,140 milligrams per kilogram (mg/kg). However, it is unclear whether the maximum was detected at Site 27 or Site 55. Later in this same section, the average lead concentrations are discussed with the average lead concentration in surface soil at Site 27 of 76.7 mg/kg, much lower than the average lead concentration of 239 mg/kg at Site 55. Based on this example, it is unclear why the COPC screening was conducted on the combined data set when it is likely that lead would not be a COPC at Site 27. However, this cannot be confirmed because

the data sets were combined for screening. According to Appendix G, Supporting Information for Health Risk Assessment, Sites 27 and 55, Table 3.1, Exposure Point Concentration Summary, Reasonable Maximum Exposure, the maximum detection of lead at Site 27 is 64.5 mg/kg, which suggests that lead is not a COPC for surface soil at Site 27. It is recommended that the COPC screening step be conducted separately for each site to promote clarity in the conceptual understanding of each site and the identification of site-related chemicals that require further risk evaluation.

12. **HHRA – Single .vs. Combined Site EUs:** The HHRA has combined Site 9 and Site 16 as one exposure unit (EUs), while Site 27 and Site 55 were evaluated as separate exposure units. However, the HHRA does not clearly explain the rationale for combining two sites as one EU and treating Sites 27 and 55 as separate EUs. It is recommended that the rationale for combining or treating each site as a separate EU be provided in Section 6.0, Human Health Risk Assessment, in order to promote clarity in the follow-on steps of the HHRA process.

13. **HHRA – Impact from Updated RSLs:** The HHRA utilized EPA's June 2011 Regional Screening Levels (RSLs) for screening chemicals for further evaluation in the HHRA. However, the RSLs were revised for some compounds in November 2011. It is recommended that the HHRA determine if the new RSLs will impact the results of the COPC selection process to ensure that chemicals have not been overlooked as COPCs. For example, the screening levels for trichloroethylene (TCE) have significantly changed (e.g., lower). While TCE has not been detected at the sites addressed in the HHRA, ensure that the RSLs for all chemicals addressed in the HHRA have not significantly changed and the identification of COPCs recommended for further evaluation has not been impacted.

14. **HHRA – Total Risks:** Based on a review of the summary of the risk characterization results presented for Sites 27 and 55 in Section 6.4 and presented Table 6-23 as well as the risk results for Sites 9 and 16 in Section 6.11 and Table 6-24, it appears that the total cumulative risk and noncancer hazard indices have been underestimated. According to Table 6-23 and 6-24, the risks are presented as "Total Surface Soil and Groundwater" and "Total Subsurface Soil and Groundwater" however, it is unclear why the different soil depth intervals are presented separately when for most scenarios involving excavation, soil exposure would be inclusive of surface and subsurface soil. Consequently, there is a concern that total cumulative risk to an individual is underestimated for exposure to all relevant exposure media. This concern is also reflected in the bar chart figures depicting cumulative hazard indices for Sites 27/55 and Sites 9/16 (e.g., Figures 6-3 and 6-7) and cumulative risks (Figure 6-5 and 6-9). As a result, bar chart figures displaying the risks for each exposure medium (e.g., groundwater, surface soil, subsurface soil, and vapor) for these groups of sites could not be reconciled with the total cumulative hazard or risk tables. To promote clarity in the document, it is recommended that the risk assessment text clearly define the depth intervals used in estimating the exposure point concentrations and ensure that total cumulative risks and hazards are inclusive of all exposure media in order to support risk management decisions at the site. Remedial Goal Options will have to be reviewed after questions are answered with respect to total risks and the remainder of the risk assessment issues.

15. **HHRA in Future Reports for Future Sites:** To expedite future HHRAs on future sites, it is recommended that the risk assessment methods for each step of the risk assessment process be prepared to address all sites and not be repeated for each site or group of sites. There appears to be quite a bit of redundancy on the methodology for the risk evaluation of Sites 27 and 55, as well as Sites 6 and 19. Consider presenting the methods for all sites in one section followed by a

separate section of risk evaluation results for each site addressed in the HHRA to expedite technical review of the RI Report.

16. **Triggers for Ecological Risk Assessment**: Section 3 hydrogeologic information indicates surficial groundwater would discharge to surface waters nearby. Section 5 also mentions the possibility of groundwater reaching the ponds. Isocontour maps indicate possible low level contaminated groundwater may be reaching the 3rd Battalion Pond. Please explain what would trigger the need for an eco risk assessment. Indicate whether sufficient data currently exists to make that determination or if the need might be triggered at some time in the future. If additional data is needed indicate whether or not that data could be gathered over time or at some particular point in the future. Consider whether or not a brief qualitative discussion may be appropriate in the RI Report either to indicate the need for data and an assessment, or to address the need to consider possible triggers for future assessment and/or monitoring requirements.

17. **Conclusions and Recommendations in Section 7:** The Navy and MCRD should make more definitive statements in their conclusions and recommendations.

According to EPA guidance, the following discussions are appropriate for this Section:

- Summarize nature and extent, fate and transport, and the risk assessment (quantitative and qualitative) – Be sure to do this for the LNAPL PTW as a source requiring treatment, in addition to the HH exposure concerns for Soils and Groundwater.
- Make conclusions and recommendations regarding proposed Remedial Action Objectives (RAOs), as well as data limitations/gaps, and the need for future work.

EPA's guidance states the RAOs should specify the contaminants and media of interest, exposure pathways of concern, and preliminary remediation goals in support of developing a range of remediation treatment and containment alternatives. Therefore, RAOs should be developed for Soil, Groundwater, and LNAPL (PTW) as media of interest. COCs are summarized for the soil and groundwater, however COCs have not been specified for the LNAPL. Preliminary Remediation Goals (PRGs) for soil and groundwater have been included in the RI Report, however, there were no PRGs proposed for LNAPL and/or the smear zone as a source area.

The Navy should revise the RI Report to include these missing items. Alternatively, the Navy may include draft RAOs for Soil and Groundwater, but include placeholder statements for LNAPL and commit to having the draft LNAPL RAOs, COCs and PRGs distributed in advance of the scoping session for the FS, for refinement during the scoping session prior to drafting of the FS.

Please revise Section 7 accordingly.

18. **Support for Scoping the Forthcoming FS:** The following analysis would be helpful in support of the scoping session for the forthcoming FS.

Co-Solvent Effects on Pesticides: Prepare to describe the co-solvent effects on pesticides as mentioned on page 4-15 and how this effect impacts alternative analysis and selection (for example, if the co-solvent is removed, would the pesticides be expected to stop leaching into the groundwater? And if so, at what concentration? Etc.)

Treatment effects on Pesticides: Prepare to describe what effect each treatment alternative may have on pesticides. For example, if ERH is proposed to treat the solvents, what effect would that degree of heat have on the pesticides present (would they break down and if so, into what? And would those be of more or less concern than the original product? Etc.)

Conference Call regarding calculations in support of data for Figures 4-38 and 4-39 LNAPL: EPA would like an opportunity to discuss the supporting calculations and may have some ideas on different ways of analyzing the data. Please advise of a date and time of your convenience.

Updated Conceptual Site Model and Cross-Sections for Site 27, and 55 if impacted: Please provide updated CSM and Cross Sections showing details of the new surface as modified by construction of the Motor-T. Be sure to base the updates on as-built drawings. Include all pertinent aspects such as any disturbance of the original grade subsurface, installation of any kind (footings, foundations, tanks, pipes, lines, cables, drains, wells, buildings, structures, fill, etc. Provide riser information for existing wells. Describe any impact to existing wells, especially any negative impacts, which might have compromised the integrity of the well and/or its usefulness for CERCLA purposes.

Appendix H: This appendix will be reviewed in preparation for the scoping session for the forthcoming FS and comments will be provided at that time. Under separate cover (electronically) EPA will provide a technical paper which addresses pros and cons pertaining to specific LNAPL technologies which the Navy and/or MCRD may find useful in developing the FS. Questions regarding the document are welcome.

19. **Support Needs for Remedial Designs and Remedial Action Work Plans:** The RI Report states in Section 7.2, Recommendations, that additional in-situ sampling for Sites 27 and 55 could be conducted as part of the remedial action design phase to refine the extent of the light non aqueous phase liquid (LNAPL) free product. It is most likely that a detailed delineation will be required to provide the data needs in order to design the remedial action, particularly if removal actions are proposed. As such, it is expected that remedial action work plans will present cross sections depicting the detailed vertical delineation of the extent of soil and/or LNAPL contamination at Sites 27 and 55.

20. **Executive Summary:** Update the executive summary as necessary based on changes to the main body of the report.

SPECIFIC COMMENTS:

1. **Section 1.4, Historical Information, Page 1-3**

Please provide historical information pertaining to the area of archeological concern south of Site 27. Identify stakeholders and potentially interested parties associated with the area.

2. **Section 1.4.3.6, Soil and Groundwater Field Screening – Site 55 (2002), Page 1-9 and Section 4.4.1, Soil and Groundwater Field Screening in 2002, Page 4-17**

Please reference the MIP report and Figures and include them in an Appendix.

3. **Table 1-1**

The table title appears to be inconsistent with the contents of the table. Please revise.

4. **Figure 1-4**

Update as necessary based on other comments regarding potential exposure to LNAPL.

5. **Section 3.3.7 Product Sampling, Page 3-15**

Please include the analytical results for the LNAPL as a table at the chapter end for easy access.

6. **Section 3.5.1, Site 27, last bullet, Page 3-29**

Modify the text as follows: "...wells be screened across the clay zones..."

7. **Section 3.5.2, Site 55, second bullet, Page 3-29**

Modify the text to read as follows: "... be collected along the bottom of the clay smear zone where LNAPL may be trapped and/or smeared. ..."

8. **Table 3-3**

For each well which was not measured (NM?) in 2011, please explain if it had been planned to be measured, and if so, why it was not measured.

9. **Table 3-5 through 3-8**

Please explain the significance of the redlined text and include it in the table key or legend.

10. **Section 4.0, USEPA Screening Levels for Human Health, Page 4-3**

Soil to Groundwater Screening: Since a significant portion of soil contamination is in subsurface soils impacted by LNAPL, and since much of this was not considered in the risk assessment (see comments on risk assessment), preliminary remediation goals for the LNAPL still need to be established (see general comments on Section 7 above.) These levels may be based in part on protection of groundwater criteria, rather than a human health soil exposure number. For ease of review and for use while considering remedial alternatives and remedial goal development in the future, please conduct a screening of comprehensive site wide soil concentrations for soil samples containing contaminants which were ultimately found to be Groundwater COCs. Screen the soil concentrations against the most conservative SSLs for Protection of Groundwater. Include a relevant discussion in the RI Report and plot exceedances on isocontour maps for surface and subsurface soil concentrations for both 27 and 55 to give an initial idea of the scope of remediation that may be necessary. A quick comparison can then be made when considering orders of magnitude differences in those screening values.

11. **Section 4.0, Nature and Extent of Contamination, Page 4-4**

The volatile organic compounds (VOCs) discussion at the top of Page 4-4 does not mention Figure 4-8, which includes the exceedances of cis-1,2 dichloroethene, tetrachloroethene, and

chloroform. Revise Section 4.0 so that the information provided in the text is consistent with that provided in the figures.

12. **Section 4.0, Nature and Extent of Contamination, Page 4-4**

The discussion of pesticides maps on Page 4-4 for Sites 9 and 16 indicates the exceedances depicted in Figure 4-13, Pesticides and PCB Exceedances in Soil, Sites 9 and 16, includes 4,4'-DDD, 4,4'DDT, alpha-Chlordane, beta-BHC, Endrin, Endrin Aldehyde, gamma-BHC, gamma-Chlordane, Heptachlor, and Heptachlor Epoxides. However, Figure 4-13 does not indicate 4,4'-DDD exceedances but 4,4'-DDE exceedances are depicted. Additionally, Figure 4-13 does not include exceedances for Endrin, Endrin Aldehyde, gamma-BHC, and Heptachlor Epoxides as indicated in the text. Finally, Figure 4-13 includes exceedances of Aroclor 1260 but is not discussed in the text. Revise this discussion on Page 4-4 so that the information provided in the text is consistent with that provided in the figures.

13. **Section 4.0, Nature and Extent of Contamination, Page 4-4**

The discussion of pesticides maps on Page 4-4 for Sites 9 and 16 indicates Figure 4-16, Pesticides and PCBs Exceedances in Groundwater, Sites 9 and 16, depicts alpha-BHC, beta-BHC, delta BHC, and Heptachlor exceedances. However, Figure 4-16 also depicts Heptachlor Epoxide exceedances which were not discussed in the text. Revise this discussion on Page 4-4 so that the information provided in the text is consistent with that provided in the figures.

14. **Section 4.0, Nature and Extent of Contamination Page 4-4**

The discussion of metals maps on Page 4-4 for Sites 9 and 16 does not present the metal exceedances in soil. Figure 4-14, Metals Exceedances in Soil, Sites 9 and 16, includes arsenic, cobalt and lead exceedances, while Figure 4-16 only presents exceedances for arsenic. Revise this discussion on Page 4-4 so that the information provided in the text is consistent with that provided in the figures.

15. **Section 4.3, Groundwater, VOCs, Sites 27 and 55, Page 4-13**

Explain the significance of the highest concentration of chlorobenzenes found in 2010 being 80 feet north-northwest of the 2008 highest concentration, (e.g. plume migration?, data gap filled?, slug located?, hot spot identification?)

16. **Section 4.4.1, LNAPL, Initial Observation & Preliminary Removal Effort in 2001 Page 4-17**

Please document the disposition of the free product removed from the FOV and the soils which were removed when installing the FOV.

17. **Section 4.4.1, Phase II RI in 2008 and Phase III in 2010, Page 4-19**

Please describe the thickness on both occasions in the RI Report.

18. **Section 4.4.2, Possible Source, Last paragraph, Page 4-20**

An apparent typo indicates Site "6", but should be "9".

19. **Section 4.4.3, Presence and Extent of LNAPL, 2nd full Par., Page 4-21**

In addition to this typical pathway to LNAPL migration moving downward through the unsaturated zone to either the clay layer or the top of the water table, EPA suspects the source of the LNAPL may have been introduced into the subsurface below the first clay layer near the FOV either through pouring into a hole or pit, or perhaps via burial of a drum. The LNAPL was then likely covered with soil again. Once released in the subsurface, the LNAPL would then float upward, portions being pinned in pools beneath the adjacent clay layer and/or smeared within the clay. The LNAPL then degraded in place and/or migrated along with groundwater underneath the clay layer. Please include this as an alternative possible fate and transport pathway or mechanism.

20. **Table 4-2, Summary of RI Groundwater Results, Site 27 - Motor Transportation Facility, Page 1 of 5**

In the summary presented for Chlorinated ethenes in Table 4-2, the second sentence states "PCE in the surface groundwater was the only sample that was above the screening criteria level." Revise the sentence to indicate that perchloroethene (PCE) was the only contaminant in the shallow groundwater that was above the screening criteria level.

21. **Figure 4-7, VOCs (Benzene, Ethylbenzene, Toluene, and Total Xylenes) Exceedances in Groundwater, Sites 27 and 55**

The screening criteria levels presented in the legend of Figure 4-7 are incorrect. The figure depicts Benzene, Toluene, Ethylbenzene and Xylene (BTEX) exceedances in groundwater. However, industrial and residential regional screening levels (RSLs) for soil are presented in the figure legend. Revise Figure 4-7 to present the BTEX maximum contaminant levels (MCLs) and tap water screening criteria levels.

22. **Section 6, RISK CHARACTERIZATION, Page 6-1**

Please ensure this section is updated throughout with respect to the Qualitative Risk Assessment for LNAPL and other risk assessment issues mentioned in the General Comments above.

23. **Section 6.1.1, Data Usability Page 6-2**

Section 6.1.1 describes which depth interval of soils were used in the HHRA. However this section does not address the usability of the data with respect to the results of the data validation process. For example, it is not clear if any data were excluded from the HHRA due to data quality flags assigned by the laboratory or by the validator. In addition, it is not clear if the data results met the reporting limits or quantification limits required for comparison to evaluation or decision-making criteria for the sites addressed in the HHRA. Further, it is unclear if there were any issues in the laboratory that may preclude the use of certain data in the risk assessment. In order to promote clarity on any limitations and uncertainties imparted on the risk conclusions due to data usability issues, it is recommended that Section 6.1.1 provide a brief summary of the data that may not have met the data usability criteria for HHRAs. Note this comment also applies to Section 6.8.1, Data Usability.

24. **Section 6.1.3.1 Surface Soil, Page 6-6**

For clarity in the report define the vertical boundary for surface soil.

25. **Section 6.1.3.2 Subsurface Soil, Page 6-7**

For clarity in the report define the vertical boundary for subsurface soil.

26. **Section 6.2.1.1, Site Sources of Environmental Contamination, Page 6-10**

Section 6.2.1.1 indicates that Site 55 is an oversized utility manhole vault used for the installation of fiber optic communications cables. However, it is unclear where the LNAPL originated since the presence of LNAPL was discovered during the installation of the utility vault. To promote clarity in the conceptual understanding of the source and release mechanisms associated with the LNAPL; Section 6.2.1.1 should attempt to explain the source of the LNAPL that was discovered during the installation of the vault.

27. **Section 6.2.2, Exposure Point Concentrations, Page 6-14**

The third bulleted item in Section 6.2.2 indicates that according to EPA Region 4 guidance, the arithmetic average of the wells in the highly concentrated area of the plume was used at the EPC for groundwater at Sites 27 and 55. However, the text states that since the groundwater plumes at Sites 27 and 55 extend over the entire area of both sites, all the monitoring wells were used in the calculation of the EPCs for groundwater. It is unclear if using all the wells within Sites 27 and 55 represents the most highly concentration area of the plumes underlying Sites 27 and 55. It is recommended that the text be expanded to explain if all the wells within Sites 27 and 55 represent the highly concentrated area of the plume. Otherwise, a subset of wells should be used if wells are included that do not represent the most highly concentrated area of the plume. Note this comment also applies to the exposure point concentration discussions for Site 9 and 16 in Section 6.9.2, Exposure point Concentrations (Page 6-58). Also update Tables of EPCs Used accordingly.

28. **Section 6.2.3.8 Vapor Intrusion Into Buildings, Page 6-25**

Please clarify if there were any buildings other than the Motor-T Facility which are located less than 100 feet from groundwater with concentrations which exceed any of the Vapor Intrusion screening levels or within 100 feet of the LNAPL area of concern as identified in Figure 3-38. If so, these facilities need to be assessed using the guidance and building specific parameters.

If it is determined there are buildings within 100 feet of the LNAPL area of concern, it would be necessary to obtain soil gas data to assess the potential vapor intrusion exposures for those facilities. Please identify this as a data gap as appropriate and propose a time to fill the data gap.

Also, please add a paragraph here that explains the Vapor Intrusion Screening does not currently account for the presence of LNAPL in groundwater and/or the vadose zone, therefore additional precautions would be needed within 100 feet of that zone (e.g. LUCs requiring vapor barriers in new construction).

29. **Section 6.4.3, Results of the Risk Characterization, Page 6-32**

Section 6.4.3 indicates that the results of the potential incremental lifetime cancer risks (ILCRs) and noncancer hazard indices (HIs) for Sites 27 and 55 are summarized in Table 6-23, Summary of Cancer Risks and Hazard Indices, Site 27- Motor Transportation Facility; and Table 6-24, Summary of Cancer Risks and Hazard Indices, Site 55 – Fiber Optic Vault. However, it is not

clear if the ICLR and HI estimates calculated for exposures to indoor air as a result of vapor intrusion into indoor air from groundwater are included in these tables. The information in Table 6-23 and Table 6-24 list ILCRs and HIs for the groundwater inhalation pathway. However, it is unclear if these results relate to the potable uses of groundwater (e.g., showering) and/or to vapor intrusion from the subsurface. If the tables include both the inhalation ICLRs and HIs associated with potable use of groundwater and from vapor intrusion, this should be clarified in the text. Otherwise, Table 6-23 and Table 6-24 should be revised to differentiate the contribution of risks from inhalation due to potable uses of groundwater and from subsurface vapor intrusion to promote clarity in the RI Report. Note this comment also applies to Section 6.11.3, Results of the Risk Characterization, for Sites 6 and 19 and Table 6-47, Summary of Cancer Risks and Hazard Indices, Site 9 -Paint Waste Storage Area, Site 16 – Pesticide Rinsate Disposal Area.

30. **Section 6.4.3.4, Carcinogenic Risks - Site 55, Page 6-35**

The last paragraph of Section 6.4.3.4 states "HIs and ILCRs for residents exposed via the vapor intrusion pathway were within acceptable levels." However, the acceptable levels were not described. It is recommended for consistency and to promote clarity in the RI Report, that Section 6.4.3.4 provide the acceptable levels being referenced (e.g., within EPA's risk management range, HI less than 1). Note: this should be done after revising the total risk (see comments above) and should caveate this does not address the LNAPL risk and therefore is not fully representative within the zone of LNAPL concern.

31. **Section 6.4.3.5, Lead Risks, Page 6-36**

The first paragraph on Page 6-36 indicates the soil ingestion rate for a construction worker was assumed to be 100 milligrams per day (mg/day). However; EPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (EPA, 2002) recommends a soil ingestion rate of 330 mg/day for a construction worker. Further, the ingestion rate of 330 mg/day was used for the construction worker scenario for all other chemicals as well as for lead at Sites 9 and 16 as indicated in Section 6.11.3.3, Lead Risks. This discrepancy was verified upon review of Appendix G.7, Lead Modeling Results, for Sites 27 and 55 where 100 mg/day was used as the ingestion rate and Appendix G.13, Lead Modeling Results, for Sites 6 and 19 where 330 mg/day was used. It is recommended that Section 6.4.3.5 and Appendix G.7 provide a justification for the use of a much lower soil ingestion rate for a construction worker exposed to lead contaminated soil. Otherwise the rate of 330 mg/day should be utilized in the model to ensure a conservative analysis and for consistency with the evaluation of lead at Sites 9 and 16.

32. **Section 6.6, Remedial Goal Options, Page 6-45**

Please include development of LNAPL remedial goals for the protection of groundwater. Present the results in a Table and explain. Additional comments may be provided on the RGOs after responses regarding total risks have been addressed.

33. **Section 6.9.3.10, Summary of Exposure Parameters, Page 6-69**

Section 6.9.3.10 states that Table 6-40 summarizes exposure input parameters for all exposure pathways associated with the identified potential receptor groups at Sites 27 and 55. However this is incorrect, Table 6-40 summarizes exposure input parameters for Sites 9 and 16. Revise the text in Section 6.9.3.10 to indicate that Table 6-40 summarizes exposure input parameters for Sites 9 and 16.

34. **Table 6-9 and 6-25 for 27 and 55; Table 6-36 and 6-48 for 9 & 16**

Comments pertaining to this information, COPCs and COCs, may be necessary after comments pertaining to total risk and other risk assessment issues are addressed.

35. **Table 6-26 through 6-27 for 27 and 55; Table 6-49 for 9 & 16**

Comments pertaining to this information, PRGs/RGOs, may be necessary after comments pertaining to total risk and other risk assessment issues are addressed.

36. **Figure 6-2, Conceptual Site Model, Site 55 - Fiber Optic Vault**

Figure 6-2 depicts "contaminated surface and subsurface soil" as the primary source of contamination. However, soil is a receiving medium that has been impacted by a contaminant source. The conceptual site model (CSM) should illustrate where the contamination originated to ensure that if remediation is warranted, the original source of the release or spill is not overlooked. Specify the source(s) of contamination (e.g., underground storage tanks, overland spills, drums) that may have impacted the surface and subsurface soils at Site 55.

37. **Figures 6-3 through 6-15**

These charts may need revisions after comments pertaining to total risk and other risk issues are addressed.

38. **Figure 6-11, Conceptual Site Model, Site 9 - Paint Waste Storage Area, Site 16 - Pesticide Rinsate Disposal Area**

Figure 6-11 depicts "contaminated surface and subsurface soil" as the primary source of contamination for both Site 9 and Site 16. However, soil is a receiving medium that has been impacted by a contaminant source. The CSM should illustrate where the contamination originated to ensure that if remedial action is needed, the original source is not overlooked. Specify the source(s) of contamination associated with Site 9 and Site 16 (e.g., storage drums, overland spills, drums, rinse waters from pest control spray application containers and equipment) and include the appropriate release mechanisms depending on the source.

39. **Section 7, Conclusions and Recommendations, Page 7-1**

Be sure to address the general comments fully.

40. **Section 7.1, Conclusions, Page 7-1**

The last sentence in the first paragraph in the subsection entitled Sites 27 and 55 incorrectly refers to Section 5.0, Chemical Fate and Transport Analysis, for the details related to the number of detects and exceedances criteria for each analyte and medium. Section 4.0, Nature and Extent of Contamination, provides the number of detects and exceedances criteria information. Revise the RI Report to address this issue.

41. **Section 7.1, Conclusions, Page 7-3**

The last sentence in the second bulleted item at the top of Page 7-3 states no chemicals were retained as contaminants of concern (COCs) for construction workers, maintenance workers, or industrial workers at Site 27. However, based on the information presented in the previous sentence, the last sentence should be revised to refer to Site 55 and not Site 27. Revise the RI Report to address this issue. Other revisions may be necessary after other risk assessment comments have been addressed.

42. **Section 7.1, Conclusion, Page 7-4**

The last bulleted item in Section 7.1 states that no chemicals were retained as COCs for trench workers. However, according to the exposure CSM presented as Figure 6-11 for Sites 9 and 16 and the information presented in Section 6.9.1.3, Potential Current and Future Receptors of Concern and Exposure Pathways, the trench worker was not evaluated for Sites 9 and 16. Additionally, the last sentence under this bulleted item incorrectly refers to Site 27 instead of Sites 9 and 16. Revise the RI Report to address these issues.